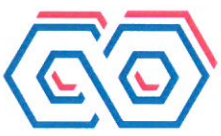
European Technical Assessment



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European Technical Assessment

ETA-18/0632 of 10/04/2019

General Part

Technical Assessment Body issuing the European Technical Assessment: ICiMB

Trade name of the construction product	BOLIX DESIGN COLLECTION EPS
Product family to which the construction product belongs	External Thermal Insulation Composite Systems (ETICS) with rendering
Manufacturer	BOLIX SA Stolarska 8 34-300 Żywiec, POLAND
Manufacturing plant	BOLIX SA Stolarska 8 34-300 Żywiec, POLAND
This European Technical Assessment contains	24 pages including 3 Annexes which form an integral part of this assessment. Annex No 4 Control Plan contains confidential information and is not included in the European Technical Assessment when that assessment is publicly disseminated.
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	ETAG 004 used as EAD, 2013

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Specific parts

1. Technical description of the product:

This product BOLIX DESIGN COLLECTION EPS is an ETICS (External Thermal Insulation Composite System with rendering) - a kit comprising components which are factory-produced by the manufacturer or component suppliers. The ETICS manufacturer is ultimately responsible for all components of the ETICS specified in this ETA.

The ETICS kit comprises a prefabricated insulation product of expanded polystyrene (EPS) to be bonded or mechanically fixed onto a wall. The method of fixing and the relevant components are specified in Table 1. The insulation product is faced with a rendering system consisting of one or more layers (site applied), one of which contains reinforcement. The rendering is applied directly to the insulating boards, without any air gap or disconnecting layer.

The ETICS may include special fittings (e.g. base profiles, corner profiles) to treat details of ETICS (connections, apertures, corners, parapets, sills). Assessment and performance of these components is not addressed in this ETA, however the ETICS manufacturer is responsible for adequate compatibility and performance within the ETICS when the components are delivered as a part of the kit.

Table 1.

	Components	Coverage (kg/m^2)	Thickness (mm)
	Bonded ETICS or bonded ETICS with supplementary mechanical fixings. National application documents shall be taken into account.		
Insulation materials with associated methods of fixing	• **Insulation product:** Boards of expanded polystyrene (EPS) according to EN 13163, white or graphite *Product characteristics - see Annex No 1*	-	20 to 400
	• **Adhesives:** - **BOLIX UWM** cement based powder requiring addition of 0,20-0,24 l/kg of water	about 4,0 (powder)	-
	- **BOLIX Z** cement based powder requiring addition of 0,19-0,21 l/kg of water	about 4,0 (powder)	-
	- **BOLIX U** cement based powder requiring addition of 0,18-0,20 l/kg of water	about 4,0 (powder)	-
	- **BOLIX ZP** ready to use polyurethane foam	about 90 ml/m^2	-
	• **Supplementary mechanical fixings:** Plastic anchors covered by relevant ETA	-	-

Table 1. cont.

	Components	Coverage (kg/m²)	Thickness (mm)
	Mechanically fixed ETICS with supplementary adhesive. National application documents shall be taken into account.		
Insulation materials with associated methods of fixing	• **Insulation product:** Boards of expanded polystyrene (EPS) according to EN 13163, white or graphite *Product characteristics - see Annex No 1*	-	50 to 400
	• **Anchors** *Products characteristics - see Annex No 2*	-	-
	• **Supplementary adhesives:** - **BOLIX UWM** cement based powder requiring addition of 0,20-0,24 l/kg of water	about 4,0 (powder)	-
	- **BOLIX Z** cement based powder requiring addition of 0,19-0,21 l/kg of water	about 4,0 (powder)	-
	- **BOLIX U** cement based powder requiring addition of 0,18-0,20 l/kg of water	about 4,0 (powder)	-
	- **BOLIX ZP** ready to use polyurethane foam	about 90 ml/m²	-
Base coats	• **BOLIX U** cement based powder requiring addition of 0,18-0,20 l/kg of water	4,0 to 6,0 (powder)	3,0 to 5,0
	• Two-component adhesive[1)] - **BOLIX UBG (component A)** cement based powder requiring addition of 0,18-0,22 l/kg of water	4,0 to 6,0 (powder)	3,0 to 5,0
	- **BOLIX FLEX (component B)** ready to use liquid	0,32 to 0,48	
	• **BOLIX UWM** cement based powder requiring addition of 0,20-0,24 l/kg of water	4,0 to 6,0	3,0 to 5,0

[1)] key coats to be used optionally onto base coat BOLIX UBG + BOLIX FLEX

Table 1. cont.

	Components	Coverage (kg/m²)	Thickness (mm)
Reinforce-ment	• **Standard glass fibre meshes** applied in one or two layers		
	- **BOLIX HD 145/S**	-	-
	- **BOLIX HD 158/S**	-	-
	- **BOLIX HD 160/S**	-	-
	- **BOLIX HD 174/S**	-	-
	• **Reinforced glass fibre mesh** to be used with standard glass fibre meshes		
	- **BOLIX HD 335/P**	-	-
	Products characteristics - see Annex No 3		
Key coats	• **BOLIX OP** ready to use liquid to be used with finishing coats: BOLIX TR, BOLIX DECO, BOLIX TM, BOLIX TM DECO and BOLIX MP KA 15	0,25 to 0,40	-
	• **BOLIX SIG KOLOR** ready to use liquid to be used with finishing coat BOLIX SIT 1 KA	0,25 to 0,40	-
	• **BOLIX T** ready to use liquid to be used with finishing coat BOLIX WS	0,10 to 0,20	-
	• **BOLIX SG** ready to use liquid to be used with finishing coat BOLIX SMP	0,10 to 0,20	-
Finishing coats	• Mineral finishing coat **BOLIX WS** cement based powder requiring addition of 0,19-0,21 l/kg of water modelled structure max. particles size: 0,5 mm	4,5 to 15,0 (powder)	3,0 to 10,0
	• Mineral finishing coat **BOLIX MP KA 15** cement based powder requiring addition of 0,22-0,24 l/kg of water; to be used in multi-layer coating with mineral finishing coat BOLIX SMP floated structure max. particles size: 1,5 mm	2,0 to 2,7 (powder)	1,5

Table 1. cont.

	Components	Coverage (kg/m²)	Thickness (mm)
Finishing coats	• Mineral finishing coat **BOLIX SMP** cement based powder requiring addition of 0,28-0,30 l/kg of water; to be used onto the base coat or mineral finishing coat BOLIX MP KA 15 spread structure max. particles size: 0,5 mm	1,4 to 3,2 (powder)	1,0 to 3,0
	• Mineral finishing coat **BOLIX TBR** cement based powder requiring addition of 0,18-0,22 l/kg of water; to be used in multi-layer coating with mineral finishing coat BOLIX BRICK POINT modelled structure max. particles size: 0,8 mm	9,5 to 14,0 (powder)	6,0 to 8,0
	• Mineral finishing coat **BOLIX BRICK POINT** cement based powder requiring addition of 0,16-0,20 l/kg of water; to be used onto the mineral finishing coat BOLIX TBR modelled structure max. particles size: 0,8 mm	5,0 to 9,5 (powder)	3,0 to 5,0
	• Acrylic finishing coat **BOLIX TR** ready to use paste – acrylic binder applied in two layers modelled structure max. particles size: 0,5 mm	2,6 to 7,0	1,5 to 4,0
	• Acrylic finishing coat **BOLIX DECO** ready to use paste – acrylic binder mosaic or modelled structure max. particles size: 0,5 ÷ 1,0; 0,5 ÷ 2,0 mm	2,5 to 3,5	1,5 to 3,0
	• Acrylic finishing coat **BOLIX TM** ready to use paste – acrylic binder mosaic structure max. particles size: 0,8; 1,6 mm	2,0 to 4,0	Regulated by particles size

Table 1. cont.

	Components	Coverage (kg/m²)	Thickness (mm)
Finishing coats	• Acrylic finishing coat **BOLIX TM DECO** ready to use paste – acrylic binder spread structure max. particles size: 0,8 mm	2,9 to 3,5	2,0 to 3,0
	• Acrylic finishing coat **BOLIX GMP** ready to use paste – acrylic binder spread structure max. particles size: 0,4 mm	0,8 to 1,2	0,3 to 0,8
	• Silicone finishing coats: ready to use pastes – silicone and acrylic binder		
	BOLIX SIT 1 KA to be used in multi-layer coating with silicone finishing coat BOLIX SIT 0,3 KA floated structure max. particles size: 1,0 mm	1,7 to 2,2	1,0
	BOLIX SIT 0,3 KA to be used onto silicone finishing coat BOLIX SIT 1 KA floated structure max. particles size: 0,3 mm	1,5 to 2,5	1,0 to 2,0
Key coats	• **BOLIX T** ready to use liquid to be used onto finishing coat BOLIX WS	0,10 to 0,20	-
	• **BOLIX N** ready to use liquid to be used with decorative coats BOLIX METALLIC POINT and BOLIX AZ / BOLIX AZ Complex	0,10 to 0,20	-
	• **BOLIX SIG** ready to use liquid to be used with decorative coats BOLIX SIL / BOLIX SIL Complex and BOLIX SIL-P	0,10 to 0,20	-
Decorative coats	• **BOLIX DECO LAZUR** ready to use pigmented liquid to be used obligatory with finishing coat BOLIX WS and optionally with finishing coat BOLIX TR	0,18 to 0,28	-

Table 1. cont.

	Components	Coverage (kg/m²)	Thickness (mm)
Decorative coats	• **BOLIX METALLIC POINT** ready to use pigmented liquid to be used obligatory with finishing coat BOLIX GMP and optionally with finishing coats BOLIX SMP and BOLIX SIT 0,3 KA	0,38 to 0,50	-
	• **BOLIX SIL / BOLIX SIL Complex** ready to use pigmented liquid to be used optionally with finishing coats BOLIX SMP and BOLIX SIT 0,3 KA	0,27 to 0,42	-
	• **BOLIX SIL-P** ready to use pigmented liquid to be used optionally with finishing coat BOLIX SMP and BOLIX SIT 0,3 KA	0,27 to 0,42	-
	• **BOLIX AZ / BOLIX AZ Complex** ready to use pigmented liquid to be used optionally with finishing coat BOLIX SMP	0,27 to 0,42	-
	• **BOLIX OM** ready to use pigmented liquid to be used optionally onto decorative coat BOLIX DECO LAZUR	0,10 to 0,30	-
	• **BOLIX BIK** ready to use pigmented liquid to be used optionally onto finishing coat BOLIX BRICK POINT	0,10 to 0,50	-
Ancillary materials	• Setting accelerator **BOLIX PW-S EXPRESS**, ready to use powder to be used optionally with adhesive BOLIX U, coverage: 10 g/kg of adhesive • Setting accelerator **BOLIX PW EXPRESS**, ready to use liquid to be used optionally with finishing coats BOLIX TR, BOLIX SIT 1 KA and BOLIX SIT 0,3 KA, coverage: 7 ml/kg of finishing coat • Other according to ETAG 004 Remain under the manufacturer's responsibility		

2. Specification of the intended use in accordance with the applicable European Assessment Document (hereinafter EAD):

This ETICS is intended for use as external insulation of buildings' walls. The walls are made of masonry (bricks, blocks, stones) or concrete (cast on site or as prefabricated panels).

The ETICS can be used on new or existing (retrofit) vertical walls. It can also be used on horizontal or inclined surfaces which are not exposed to precipitation.

The ETICS is made of non load-bearing construction elements. It does not contribute directly to the stability of the wall on which it is installed, but it can contribute to durability by providing enhanced protection from the effect of weathering.

The ETICS is not intended to ensure the airtightness of the building structure.

The provisions made in this European Technical Assessment are based on an assumed working life of the ETICS of at least 25 years, provided that the requirements for the packaging, transport, storage, installation as well as appropriate use, maintenance and repair are met. The indication given on the working life cannot be interpreted as a guarantee given by the manufacturer or the Technical Assessment Body, but should only be regarded as a means for choosing the appropriate products in relation to the expected, economically reasonable working life of the works.

Design, installation, maintenance and repair of ETICS shall be done in accordance with principles introduced in chapter 7 of ETAG 004, used as EAD, and shall be in conformity with Member States' legislation requirements.

The instructions regarding packaging, transport, storage and installation of ETICS are specified in the manufacturer's technical documentation.

3. Performance of the product and references to the methods used for its assessment:

The performances of the kit as described in this chapter are valid provided that the components of the kit comply with Annexes No 1÷3.

3.1. Safety in case of fire (BWR 2)

3.1.1. Reaction to fire (ETAG 004: clause 5.1.2.1, EN 13501-1)

Table 2.

Configuration	Max. heat of combustion MJ/kg	Flame retardant content	Euroclass acc. to EN 13501-1
Adhesive (excluding BOLIX ZP)	0,32	No flame retardant	B-s2, d0
EPS boards* *density ≤ 24,0 kg/m³*	-		
Base coat	0,49		
Glass fibre mesh - standard - reinforced	 8,61 6,70		
Key coat	31,95		
Finishing coat	3,53		
Key coat	31,95		
Decorative coat	26,36		
Configuration including polyurethane foam BOLIX ZP	-	-	No performance assessed
*flame retardant content in quantity ensuring Euroclass E according to EN 13501-1			

Note: European reference fire scenario has not been laid down for facades. In some Member States, the classification of ETICS according to EN 13501-1 might not be sufficient for the use in facades. An additional assessment of ETICS according to national provisions might be necessary to comply with Member State regulations, until the existing European classification system has been completed.

3.2. Hygiene, health and environment (BWR 3)

3.2.1. Water absorption (ETAG 004: clause 5.1.3.1)

- Base coat BOLIX U:
  - Water absorption after 1 hour < 1 kg/m²;
  - Water absorption after 24 hours < 0,5 kg/m².
- Base coat BOLIX UBG + BOLIX FLEX:
  - Water absorption after 1 hour < 1 kg/m²;
  - Water absorption after 24 hours < 0,5 kg/m².

- Base coat BOLIX UWM:
  - Water absorption after 1 hour < 1 kg/m²;
  - Water absorption after 24 hours < 0,5 kg/m².
- Rendering systems: Table 3.

Table 3.

		Water absorption after 24 hours	
		<0,5 kg/m²	≥0,5 kg/m²
Rendering system: Base coat BOLIX U + key coat + finishing coat + key coat + decorative coat indicated hereafter (if relevant):	BOLIX T + BOLIX WS + BOLIX T + BOLIX DECO LAZUR	x	-
	BOLIX OP + BOLIX MP KA 15 + BOLIX SG + BOLIX SMP	-	x
	BOLIX SG + BOLIX SMP	-	x
	BOLIX TBR + BOLIX BRICK POINT	x	-
	BOLIX OP + BOLIX TR	x	-
	BOLIX OP + BOLIX DECO	x	-
	BOLIX OP + BOLIX TM	x	-
	BOLIX OP + BOLIX TM DECO	x	-
	BOLIX GMP + BOLIX N + BOLIX METALLIC POINT	x	-
	BOLIX SIG KOLOR + BOLIX SIT 1 KA + BOLIX SIT 0,3 KA	x	-
Rendering system: Base coat BOLIX UBG + BOLIX FLEX + finishing coat + key coat + decorative coat indicated hereafter (if relevant):	BOLIX WS + BOLIX T + BOLIX DECO LAZUR	x	-
	BOLIX MP KA 15 + BOLIX SG + BOLIX SMP	-	x
	BOLIX SMP	-	x
	BOLIX TBR + BOLIX BRICK POINT	x	-
	BOLIX TR	x	-
	BOLIX DECO	x	-
	BOLIX TM	x	-
	BOLIX TM DECO	x	-
	BOLIX GMP + BOLIX N + BOLIX METALLIC POINT	x	-
	BOLIX SIT 1 KA + BOLIX SIT 0,3 KA	x	-

Table 3. cont.

		Water absorption after 24 hours	
		<0,5 kg/m²	≥0,5 kg/m²
Rendering system: Base coat BOLIX UWM + key coat + finishing coat + key coat + decorative coat indicated hereafter (if relevant):	BOLIX T + BOLIX WS + BOLIX T + BOLIX DECO LAZUR	x	-
	BOLIX OP + BOLIX MP KA 15 + BOLIX SG + BOLIX SMP	-	x
	BOLIX SG + BOLIX SMP	-	x
	BOLIX TBR + BOLIX BRICK POINT	x	-
	BOLIX OP + BOLIX TR	x	-
	BOLIX OP + BOLIX DECO	x	-
	BOLIX OP + BOLIX TM	x	-
	BOLIX OP + BOLIX TM DECO	x	-
	BOLIX GMP + BOLIX N + BOLIX METALLIC POINT	x	-
	BOLIX SIG KOLOR + BOLIX SIT 1 KA + BOLIX SIT 0,3 KA	x	-

3.2.2. Watertightness (ETAG 004: clause 5.1.3.2)

3.2.2.1. Hygrothermal behaviour (ETAG 004: clause 5.1.3.2.1)

Pass (without defects).

3.2.2.2. Freeze-thaw behaviour (ETAG 004: clause 5.1.3.2.2)

ETICS is frost resistant according to water absorption test and freeze-thaw test.

3.2.3. Impact resistance (ETAG 004: clause 5.1.3.3)

Table 4.

		Single layer of standard mesh
Rendering system: Base coat BOLIX U + key coat + finishing coat + key coat + decorative coat indicated hereafter (if relevant):	BOLIX T + BOLIX WS + BOLIX T + BOLIX DECO LAZUR	Category III
	BOLIX OP + BOLIX MP KA 15 + BOLIX SG + BOLIX SMP	Category III
	BOLIX SG + BOLIX SMP	Category III
	BOLIX TBR + BOLIX BRICK POINT	Category I
	BOLIX OP + BOLIX TR	Category II
	BOLIX OP + BOLIX DECO	Category II
	BOLIX OP + BOLIX TM	Category II
	BOLIX OP + BOLIX TM DECO	Category II
	BOLIX GMP + BOLIX N + BOLIX METALLIC POINT	Category III
	BOLIX SIG KOLOR + BOLIX SIT 1 KA + BOLIX SIT 0,3 KA	Category II
Rendering system: Base coat BOLIX UBG + BOLIX FLEX + finishing coat + key coat + decorative coat indicated hereafter (if relevant):	BOLIX WS + BOLIX T + BOLIX DECO LAZUR	Category III
	BOLIX MP KA 15 + BOLIX SG + BOLIX SMP	Category III
	BOLIX SMP	Category III
	BOLIX TBR + BOLIX BRICK POINT	Category I
	BOLIX TR	Category I
	BOLIX DECO	No performance assessed
	BOLIX TM	Category II
	BOLIX TM DECO	Category II
	BOLIX GMP + BOLIX N + BOLIX METALLIC POINT	Category III
	BOLIX SIT 1 KA + BOLIX SIT 0,3 KA	Category I

Table 4. cont.

		Single layer of standard mesh
Rendering system: Base coat BOLIX UWM + key coat + finishing coat + key coat + decorative coat indicated hereafter (if relevant):	BOLIX T + BOLIX WS + BOLIX T + BOLIX DECO LAZUR	Category III
	BOLIX OP + BOLIX MP KA 15 + BOLIX SG + BOLIX SMP	Category III
	BOLIX SG + BOLIX SMP	Category III
	BOLIX TBR + BOLIX BRICK POINT	Category I
	BOLIX OP + BOLIX TR	Category I
	BOLIX OP + BOLIX DECO	No performance assessed
	BOLIX OP + BOLIX TM	Category II
	BOLIX OP + BOLIX TM DECO	Category II
	BOLIX GMP + BOLIX N + BOLIX METALLIC POINT	Category III
	BOLIX SIG KOLOR + BOLIX SIT 1 KA + BOLIX SIT 0,3 KA	Category I

3.2.4. Water vapour permeability (ETAG 004: clause 5.1.3.4)

Table 5.

		Average equivalent air thickness s_d
Rendering system: Base coat BOLIX U or BOLIX UBG + BOLIX FLEX or BOLIX UWM + key coat + finishing coat + key coat + decorative coat indicated hereafter (if relevant):	BOLIX T + BOLIX WS + BOLIX T + BOLIX DECO LAZUR + BOLIX OM	≤ 2 m, result: 0,3 m
	BOLIX OP + BOLIX MP KA 15 + BOLIX SG + BOLIX SMP + BOLIX N + BOLIX METALLIC POINT + BOLIX SIG + BOLIX SIL / BOLIX SIL Complex + BOLIX SIG + BOLIX SIL-P + BOLIX N + BOLIX AZ / BOLIX AZ Complex	≤ 2 m, results: 0,3 m 0,2 m 0,2 m 0,2 m
	BOLIX SG + BOLIX SMP + BOLIX N + BOLIX METALLIC POINT + BOLIX SIG + BOLIX SIL / BOLIX SIL Complex + BOLIX SIG + BOLIX SIL-P + BOLIX N + BOLIX AZ / BOLIX AZ Complex	≤ 2 m, results: 0,3 m 0,2 m 0,2 m 0,2 m
	BOLIX TBR + BOLIX BRICK POINT + BOLIX BIK	≤ 2 m, result: 0,2 m
	BOLIX OP + BOLIX TR + BOLIX T + BOLIX DECO LAZUR + BOLIX OM	≤ 2 m, result: 0,5 m
	BOLIX OP + BOLIX DECO	≤ 2 m, result: 0,3 m
	BOLIX OP + BOLIX TM	≤ 2 m, result: 0,5 m
	BOLIX OP + BOLIX TM DECO	≤ 2 m, result: 0,3 m
	BOLIX GMP + BOLIX N + BOLIX METALLIC POINT	≤ 2 m, result: 0,3 m
	BOLIX SIG KOLOR + BOLIX SIT 1 KA + BOLIX SIT 0,3 KA + BOLIX N + BOLIX METALLIC POINT + BOLIX SIG + BOLIX SIL / BOLIX SIL Complex + BOLIX SIG + BOLIX SIL-P	≤ 2 m, results: 0,5 m 0,5 m 0,6 m

3.2.5. Release of dangerous substances (ETAG 004: clause 5.1.3.5, EOTA TR034)

No performance assessed.

Note: There may be requirements applicable to the ETICS falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Regulation (EU) No 305/2011, these requirements need to be complied with, when and where they apply.

3.3. Safety and accessibility in use (BWR 4)

3.3.1. Bond strength between base coat and insulation product (ETAG 004: clause 5.1.4.1.1)

Base coat: BOLIX U

- Initial state and after hygrothermal cycles:
  ≥ 0,08 MPa

Base coat: BOLIX UBG + BOLIX FLEX

- Initial state and after hygrothermal cycles:
  ≥ 0,08 MPa

Base coat: BOLIX UWM

- Initial state and after hygrothermal cycles:
  ≥ 0,08 MPa

3.3.2. Bond strength between adhesive and substrate (ETAG 004: clause 5.1.4.1.2)

Table 6.

	Initial state	48 h immersion in water + 2 hours 23°C/50% RH	48 h immersion in water + 7 days 23°C/50% RH
BOLIX UWM	≥ 0,80 MPa	≥ 0,60 MPa	≥ 0,80 MPa
BOLIX Z	≥ 0,80 MPa	≥ 0,60 MPa	≥ 0,80 MPa
BOLIX U	≥ 0,80 MPa	≥ 0,60 MPa	≥ 0,80 MPa

3.3.3. Bond strength between adhesive and insulation product (ETAG 004: clause 5.1.4.1.3)

Table 7.

	Initial state	48 h immersion in water + 2 hours 23°C/50% RH	48 h immersion in water + 7 days 23°C/50% RH
BOLIX UWM	≥ 0,10 MPa	≥ 0,05 MPa	≥ 0,10 MPa
BOLIX Z	≥ 0,08 MPa	≥ 0,03 MPa	≥ 0,08 MPa
BOLIX U	≥ 0,10 MPa	≥ 0,05 MPa	≥ 0,10 MPa

3.3.4. Bond strength of foam adhesive (ETAG 004: clause 5.1.4.1.4)

- Bond strength between BOLIX ZP:
  All applications conditions according to EOTA TR046 ≥ 0,08 MPa

  Minimal bonded surface area S: 40 %

3.3.5. Bond strength after ageing (ETAG 004: clause 5.1.7.1)

Table 8.

		After hygrothermal cycles
Rendering system: Base coat BOLIX U + key coat + finishing coat + key coat + decorative coat indicated hereafter (if relevant):	BOLIX T + BOLIX WS + BOLIX T + BOLIX DECO LAZUR	≥ 0,09 MPa
	BOLIX OP + BOLIX MP KA 15 + BOLIX SG + BOLIX SMP	≥ 0,09 MPa
	BOLIX SG + BOLIX SMP	≥ 0,10 MPa
	BOLIX TBR + BOLIX BRICK POINT	≥ 0,10 MPa
	BOLIX OP + BOLIX TR	≥ 0,10 MPa
	BOLIX OP + BOLIX DECO	≥ 0,10 MPa
	BOLIX OP + BOLIX TM	≥ 0,10 MPa
	BOLIX OP + BOLIX TM DECO	≥ 0,10 MPa
	BOLIX GMP + BOLIX N + BOLIX METALLIC POINT	≥ 0,09 MPa
	BOLIX SIG KOLOR + BOLIX SIT 1 KA + BOLIX SIT 0,3 KA	≥ 0,10 MPa
Rendering system: Base coat BOLIX UBG + BOLIX FLEX + finishing coat + key coat + decorative coat indicated hereafter (if relevant):	BOLIX WS + BOLIX T + BOLIX DECO LAZUR	≥ 0,10 MPa
	BOLIX MP KA 15 + BOLIX SG + BOLIX SMP	≥ 0,10 MPa
	BOLIX SMP	≥ 0,10 MPa
	BOLIX TBR + BOLIX BRICK POINT	≥ 0,10 MPa
	BOLIX TR	≥ 0,10 MPa
	BOLIX DECO	≥ 0,10 MPa
	BOLIX TM	≥ 0,10 MPa
	BOLIX TM DECO	≥ 0,10 MPa
	BOLIX GMP + BOLIX N + BOLIX METALLIC POINT	≥ 0,10 MPa
	BOLIX SIT 1 KA + BOLIX SIT 0,3 KA	≥ 0,10 MPa

Table 8. cont.

		After hygrothermal cycles
Rendering system: Base coat BOLIX UWM + key coat + finishing coat + key coat + decorative coat indicated hereafter (if relevant):	BOLIX T + BOLIX WS + BOLIX T + BOLIX DECO LAZUR	≥ 0,08 MPa
	BOLIX OP + BOLIX MP KA 15 + BOLIX SG + BOLIX SMP	≥ 0,08 MPa
	BOLIX SG + BOLIX SMP	≥ 0,08 MPa
	BOLIX TBR + BOLIX BRICK POINT	≥ 0,08 MPa
	BOLIX OP + BOLIX TR	≥ 0,10 MPa
	BOLIX OP + BOLIX DECO	≥ 0,10 MPa
	BOLIX OP + BOLIX TM	≥ 0,10 MPa
	BOLIX OP + BOLIX TM DECO	≥ 0,10 MPa
	BOLIX GMP + BOLIX N + BOLIX METALLIC POINT	≥ 0,10 MPa
	BOLIX SIG KOLOR + BOLIX SIT 1 KA + BOLIX SIT 0,3 KA	≥ 0,10 MPa

3.3.6. Fixing strength (ETAG 004, clause 5.1.4.2)

Test not required. ETICS fulfils the criteria $E \cdot d \leq 50\,000$ N/mm.

3.3.7. Wind load resistance (ETAG 004, clause 5.1.4.3)

Table 9.

Anchors for which the following failure loads apply		**Anchors according to Annex No 2**	
		Plate diameter (mm)	≥ 60
Characteristics of the **EPS boards** for which the following failure loads apply		Thickness (mm)	≥ 50
		Tensile strength perpendicular to the faces (kPa)	≥ 100
Failure loads (N)	Anchors not placed at the panel joints (*Pull-through test*) dry conditions	R_{panel}	Minimum: 442 Average: 460
	Anchors placed at the panel joints (*Pull-through test*) dry conditions	R_{joint}	Minimum: 423 Average: 450

The wind load resistance of the ETICS R_d is calculated as follows:

$$R_d = \frac{R_{panel} \times n_{panel} + R_{joint} \times n_{joint}}{\gamma m}$$

where:

n_{panel}: number (per m^2) of anchors not placed at the panel joints
n_{joint}: number (per m^2) of anchors placed at the panel joints
γm: national safety factor

3.3.8. Render strip tensile test (ETAG 004: clause 5.5.4.1)

No performance assessed.

3.3.9. Shear strength and shear modulus of foam adhesive (ETAG 004: clause 5.7.4.1)

Table 10.

	Shear strength (kPa)	Shear modulus (kPa)
BOLIX ZP	≥ 78,4	≥ 525

3.3.10. Post expansion behaviour of foam adhesive (ETAG 004: clause 5.7.4.2)

Table 11.

	Expansion (mm) after -initial thickness 8 mm-					
	5 min.	10 min.	20 min.	40 min.	60 min.	24 hours
BOLIX ZP	0,80	0,46	0,14	0,12	0,17	0,26

3.4. Protection against noise (BWR 5)

3.4.1. Airborne sound insulation (ETAG 004: clause 5.1.5.1)

No performance assessed.

3.5. Energy economy and heat retention (BWR 6)

3.5.1. Thermal resistance (ETAG 004: clause 5.1.6.1)

The thermal transmittance of the substrate wall covered by the ETICS is calculated in accordance with the standard EN ISO 6946:

$$U_c = U + \chi_p \cdot n$$

where:

$\chi_p \cdot n$ has only to be taken into account if it is greater than 0,04 W/(m^2·K)

U_c: global (corrected) thermal transmittance of the covered wall (W/ (m^2·K))
n: number of anchors (through insulation product) per 1 m^2

χ_p: local influence of thermal bridge caused by an anchor. The values listed below can be taken into account if not specified in the anchor's ETA:

= 0,002 W/K for anchors with a stainless steel screw covered by plastic anchors and for anchors with an air gap at the head of the screw

($\chi_p \cdot n$ negligible for n < 20)

= 0,004 W/K for anchors with a galvanized steel screw with the head covered by a plastic material ($\chi_p \cdot n$ negligible for n < 10)

= negligible for anchors with plastic nails (reinforced or not with glass fibres)

U: thermal transmittance of the current part of the covered wall (excluding thermal bridges) (W/ ($m^2 \cdot K$)) determined as follows:

$$U = \frac{1}{R_i + R_{render} + R_{substrate} + R_{se} + R_{si}}$$

where:

R_i: thermal resistance of the insulation product (according to declaration in reference to EN 13163) in ($m^2 \cdot K$)/W

R_{render}: thermal resistance of the render (about 0,02 in ($m^2 \cdot K$)/W or determined by test according to EN 12667 or EN 12664)

$R_{substrate}$: thermal resistance of the substrate of the building (concrete, brick) in ($m^2 \cdot K$)/W

R_{se}: external superficial thermal resistance in ($m^2 \cdot K$)/W

R_{si}: internal superficial thermal resistance in ($m^2 \cdot K$)/W

The value of thermal resistance of each insulation product shall be given in the manufacturer's documentation along with the possible range of thicknesses. In addition, the point thermal conductivity of anchors shall be given when anchors are used in the ETICS.

3.6. Sustainable use of natural resources (BWR 7)

No performance assessed.

4. Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base:

According to the European Commission decision 97/556/EC amended by the European Commission decision 2001/596/EC, the AVCP systems (further described in Annex V to Regulation (EU) No 305/2011) 1 and 2+ apply.

Table 12.

Product(s)	Intended use(s)	Level(s) or class(es) (Reaction to fire)	System(s)
External thermal insulation composite systems/kits (ETICS) with rendering	in external wall subject to fire regulations	A1 [1], A2 [1], B [1], C [1]	1
		A1 [2], A2 [2], B [2], C [2], D, E, (A1 to E) [3], F	2+
	in external wall not subject to fire regulations	any	2+

[1] Products/materials for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limiting of organic material)

[2] Products/materials not covered by footnote [1]

[3] Products/materials that do not require to be tested for reaction to fire (e.g. products/materials of Classes A1 according to Commission Decision 96/603/EC)

5. Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD:

The manufacturer shall exercise permanent control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures. The production control system shall ensure performance constancy of the product covered by this European Technical Assessment.

The manufacturer may only use materials stated in the technical documentation of this European Technical Assessment. The factory production control shall be performed in accordance with the Control Plan which is a confidential part of the European Technical Assessment. The Control Plan was developed as a part of factory production control system.

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan.

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By

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Annexes:

Annex No 1 – Insulation products characteristics

Annex No 2 – Anchors characteristics for mechanically fixed ETICS with supplementary adhesive

Annex No 3 – Glass fibre meshes characteristics

Annex No 1 – Insulation products characteristics

		Boards of expanded polystyrene EPS white or graphite	
		Bonded ETICS	**Mechanically fixed ETICS**
Reaction to fire / EN 13501-1		Euroclass – E max. density: 24,0 kg/m^3	
Thermal resistance		Defined in the CE marking in reference to EN 13163 (m^2·K)/W	
Thickness / EN 823		± 2 mm [EN 13163 – T(2)]	
Length / EN 822		± 2 mm [EN 13163 – L(2)]	
Width / EN 822		± 2 mm [EN 13163 – W(2)]	
Squareness / EN 824		± 5 mm/m [EN 13163 – S(5)]	
Flatness / EN 825		5 mm [EN 13163 – P(5)]	
Dimensional stability under specified conditions	EN 1603	± 0,2 % [EN 13163 – DS(N)2]	
	EN 1604	2 % [EN 13163 – DS(70,-)2]	
Bending strength / EN 12089		≥ 75 kPa [EN 13163 – BS75]	
Water vapour permeability, diffusion factor (μ) / EN 12086 – EN 13163		20 to 40	
Tensile strength perpendicular to the faces in dry conditions / EN 1607		≥ 80 kPa [EN 13163 – TR80]	≥ 100 kPa [EN 13163 – TR100]
Shear strength / EN 12090 – EN 13163		≥ 35 kPa	

Annex No 2 – Anchors characteristics for mechanically fixed ETICS with supplementary adhesive

Anchor trade name	Plate stiffness (kN/mm) / diameter (mm)	Characteristic resistance in the substrate
EJOT H1 eco EJOT H4 eco	0,6 / 60	ETA 11/0192
Ejotherm STR U 2G	0,6 / 60	ETA 04/0023
Insulation anchor Koelner TFIX-8S, Koelner TFIX-8ST	0,6 / 60	ETA 11/0144
Insulation suport TFIX-8M	1,0 / 60	ETA 07/0336
Rawlplug Facade Insulation Fixing R-TFIX-8M	1,0 / 60	ETA 17/0592
RAWLPLUG Insulation System R-TFIX-8S	0,6 / 60	ETA 17/0161
KOELNER KI-10M	0,4 / 60	ETA-07/0291
KI-10N KI-10NS	0,5 / 60	ETA-07/0221
WKTHERMø8	0,6 / 60	ETA 11/0232
WKTHERM S	0,6 / 60	ETA 13/0724
Fischer TERMOZ 8 U Fischer TERMOZ 8 UZ	0,5 / 60	ETA-02/0019
fischer termoz CN 8 fischer termoz CN 8 R fischer termoz CNplus 8	0,6 / 60	ETA-09/0394
fischer termoz CS 8	0,6 / 60	ETA-14/0372

Additionally, other anchors covered by relevant ETA can be used, provided that they meet the following requirements:

	Requirement
Plate diameter	≥ 60 mm
Plate stiffness	≥ 0,4 kN/mm

Annex No 3 – Glass fibre meshes characteristics

Mesh trade name		Description	Alkalis resistance	
			Residual resistance after ageing (N/mm)	Relative residual resistance: % (after ageing) of the strength in the as delivered state
BOLIX HD 145/S	R 117 A101*	Mass per unit area: 152 g/m^2 Mesh size: 4,0 x 4,5 mm	≥ 20	≥ 50
BOLIX HD 158/S	ST 2924-100/7 KM	Mass per unit area: 155 g/m^2 Mesh size: 4,8 x 3,7 mm	≥ 20	≥ 50
BOLIX HD 160/S	03-1	Mass per unit area: 160 g/m^2 Mesh size: 3,5 x 3,8 mm	≥ 20	≥ 50
	SSA-1363-160 SM0.5A	Mass per unit area: 160 g/m^2 Mesh size: 3,6 x 3,8 mm		
BOLIX HD 174/S	ST 112-100/7KM	Mass per unit area: 170 g/m^2 Mesh size: 4,0 x 3,7 mm	≥ 20	≥ 50
BOLIX HD 335/P	REDNET E335	Mass per unit area: 335 g/m^2 Mesh size: 6,0 x 9,0 mm	≥ 20	≥ 50

*mesh covered by ETA 13/0392

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